SIP™
Simplex Ideal Peerless

Ideal™ 1000 Manual

20016-6111

Contents

1. Introduction

1.0 Introduction

Thank you for selecting the Simplex•Ideal•Peerless Reel Mower Grinder. The Peerless 2000 Grinder is designed and built from top quality materials and components by people who care, and it will give you decades of service.

Please take a few minutes to register your grinder on our web site www.sipgrinder.com so that we can provide you better service and support.

1.1 Safety Guidelines

The following are general safety guidelines. Please read and understand these guidelines before proceeding. As is the case with most machinery, failure to operate it in a safe manner may result in damage, injury or loss of life. Please be careful.

1. Always close shield or wear safety glasses and face shield when grinding!

2. Keep all guards in place and functioning.

3. Do not wear any loose clothing or jewelry which may get caught in the machinery. Secure long hair.

4. Keep your work area clean and organized.

5. Set up the work properly, using the correct tools and fixtures. Ensure that work is securely clamped.

6. Use the wrenches provided when changing the grinding wheel and always ensure that nut is tight. Do not overtightening as that may damage the grinding wheel.

7. Always replace damaged grinding wheel.

8. Never leave grinder running while unattended.

In addition to the safety guidelines just listed, there are safety notices through out this manual which are denoted as follows:

An Information Notice provides information or a caution where minor damage may occur.

Running the spin motor too fast may damage the indexer.

A Warning Notice indicates a situation which could cause severe damage, serious injury or death.

Always close shield or wear safety glasses and face shield when grinding.

A Danger Notice indicates a very dangerous situation which if continued will cause severe damage, serious injury or death.

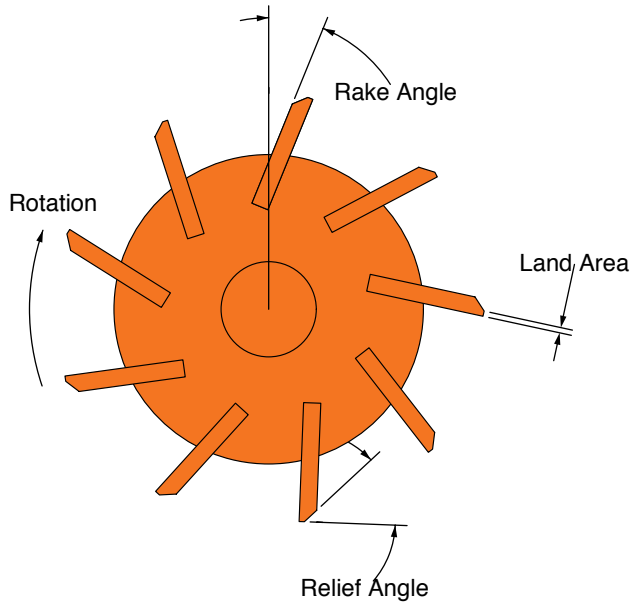
Do not overtighten the nut as it will cause the grinding wheel to explode!

Again, make sure that you read and understand these warnings before proceeding because failure to operate any machinery in a safe manner may result in damage, injury or loss of life.

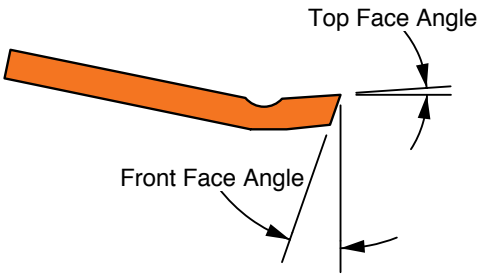
1.2 Principles of Sharpening

The reel type lawn mower cuts grass using the principles of shears. It is necessary, therefore, to have two sharp cutting edges making close enough contact to cut the grass cleanly. This is the least harmful method of mowing grass, because each blade of grass is supported by the bed knife while the reel blade shears it off. This eliminates bleeding and brown tops which occur when the grass is whipped off with rotary type mowers.

On a five bladed reel mower, the bed knife does five times the work of any one reel blade as all the reel blades must shear against it. The bed knife, therefore, is the master cutting element and although made of heavier and harder steels, it is impossible to properly sharpen a mower with dull reel blades without sharpening the bed knife too.



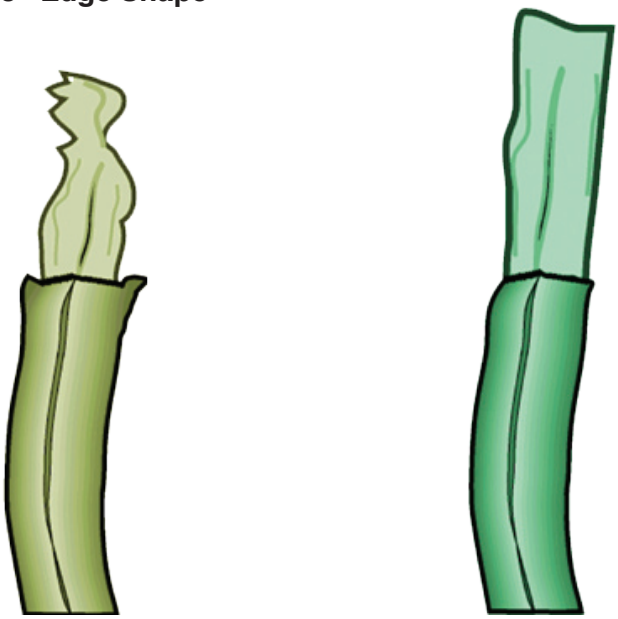
The figure above shows the different features of the reel mower blades. The reel blade **Relief Angle** serves reduces the contact area between the reel and the bed knife. It is created by individually relief grinding each reel blade. The **Land Area** indicates how much of the reel blade is contacting the bed knife and is created during spin grinding. The **Rake Angle** is set by the slot in the spider and ensures that the cutting edge is the first part of the blade to touch the grass blade. It can not be changed.



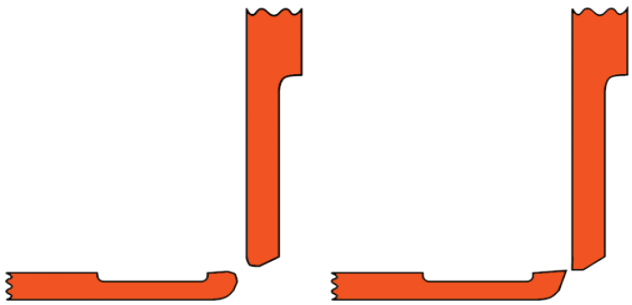
The bed knife **Front Face Angle** is used to support the blade as it is being cut. It does not need to be ground regularly as it does not wear and change shape. Bed knife life is increases, however, by grinding both the top and front surfaces of the bed knife to eliminate the rounded edge. The bed knife **Top Face Relief Angle** provides reduced contact area between the reel blade and the bed knife blade. It also creates clearance for the cut grass and other materials. It is the wear surface on the bed knife and must be ground regularly to keep it straight and sharp.

For a mower to run easily and cut freely, it is important that proper bevel or relief angle be ground on both the bed knife cutting edge and the reel blades cutting edges. This gives clearance or relief behind the contacting edges and reduces drag and friction. Too little relief angle would leave more metal in contact causing the mower to run hard. Too much clearance or angle would weaken the cutting edges and they would nick easily and would not hold their edge.

1.3 Edge Shape



If the mower is not cutting the grass cleanly, the cut end of the grass blade will appear torn and ragged. When a mower is brought in for servicing, it is important to determine why it is not cutting properly. Often, if the mower is operating satisfactorily in every respect except cutting the grass cleanly, it may only need an adjustment of the bed knife to the reel blades. Examination of the cutting edges and shearing corner on the reel blades and bed knife should determine if the mower needs a complete grinding job. Often, properly adjusting the bed knife is all that is required. Grinding the reel is necessary if any of the following conditions exist:



1. Significantly rounded blade edges.
2. Bent or nicked reel blades which cause streaking or irregular contact between reel blades.
3. Uneven blade wear.
4. Significantly cone shaped.
5. When all or most of the relief is worn away.

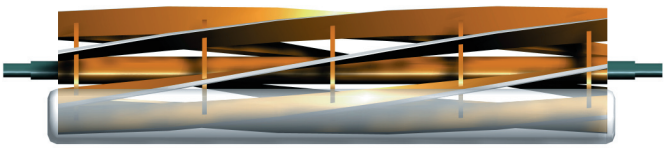
1.4 Reel Shape

The process of sharpening a lawn mower is really one of reshaping the cutting edge of the bed knife and the reel blades by grinding, to restore their ability to cut grass. Equally important is the restoration of the match, or fit, of the reel blades to the cutting edge of the bed knife, against which all reel blades shear or cut. It is also important that the bed knife blade and the bottom of the reel blades are parallel to the bottom of the rollers and the rollers are parallel to each other. It is desirable for the reel to have little or no cone shape. This makes for a more even cut and minimizes ridges and lines in the cut and gouges in the turf

Through normal wear or improper grinding the reel will become cone shaped.

Conventional wisdom said that when you grind a reel, it should be ground into a true cylinder. This is true if both the front and rear rollers are adjustable. If one of the rollers is fixed and not parallel to the reel shaft, a cylindrical reel will result in an uneven cut. This is why it is important to always grind the bottom of the reel parallel to the bottom of the rollers.

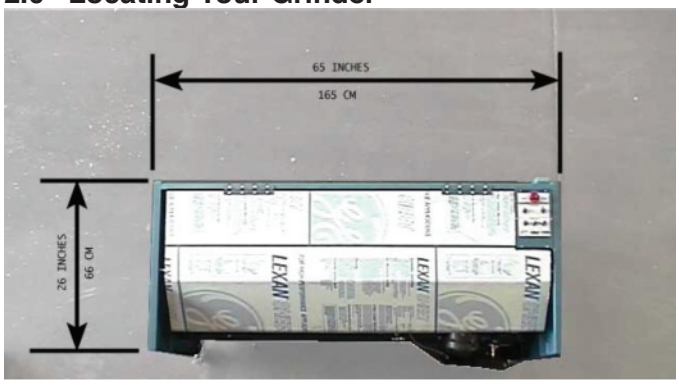
It is also important that the rollers are parallel to each other. If they are not, the reel will rock and give an uneven cut or gouge the turf.



Only the Peerless 2000 is designed to grind the reels parallel to the rollers and make it easy to parallel the rollers to each other.

2. Set Up

2.0 Locating Your Grinder



Determine where on a concrete slab the Ideal 1000 will be located.

The Ideal 1000 requires standard 110 volt, 60 Hz, single phase service. Foreign versions with 200 volt, 50 Hz, single phase are available. The grinder comes with an 8 foot grounded cord for 110 volt service. The grinder also requires about 70 psi clean compressed air.

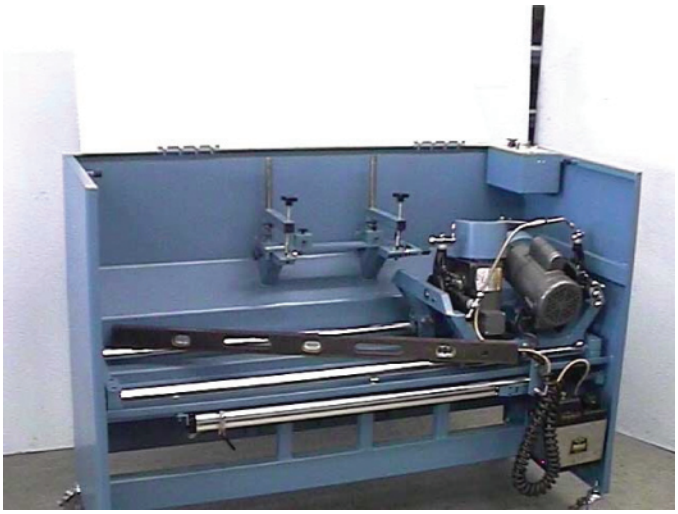
2.1 Unpacking the Grinder

While unpacking, examine carefully for any shipping damage. Any damage should be reported immediately to the carrier.

By now you have removed the plastic wrap from the main crate. After removing the box of accessories and any other optional equipment, unbolt the grinder from the pallet and place it in the location you have selected.

2.2 Leveling the Base

Mount the leveling pads provided in to the four corners of the grinder.

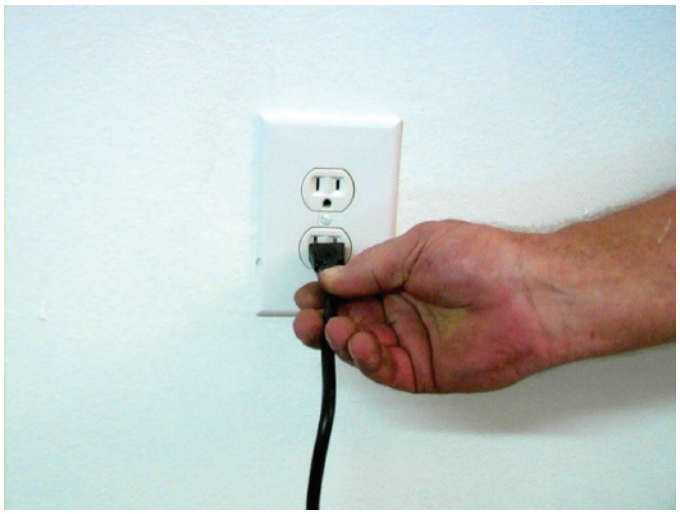


With the grinder in its final location, use a good quality carpenters level and adjust the leveling pads until grinder is level.

2.3 Connecting the service

Make sure that all of the switches are turned off.

Connect the air supply to the filter regulator and set the pressure gauge to 50 psi.



Plug the electrical cord into a 110 volt outlet.

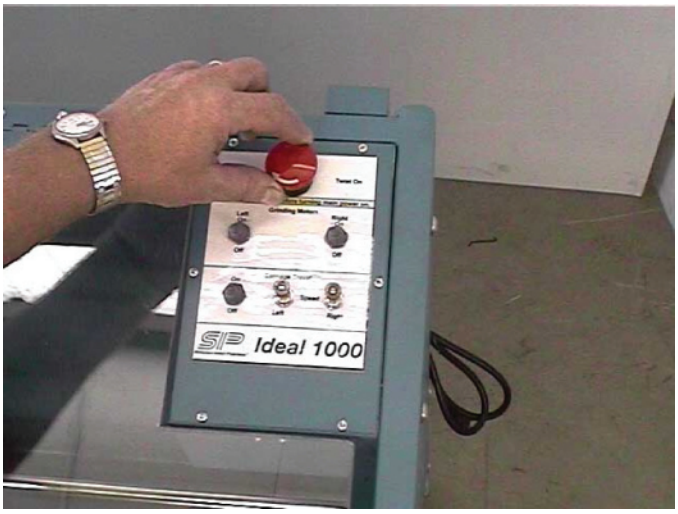
3. Preparing to Grind

3.0 Preparing the reel mower for grinding

Clean all dirt, grass, rust, grease, and oil from the mower assembly, especially where it accumulates behind the lip of the bed knife.

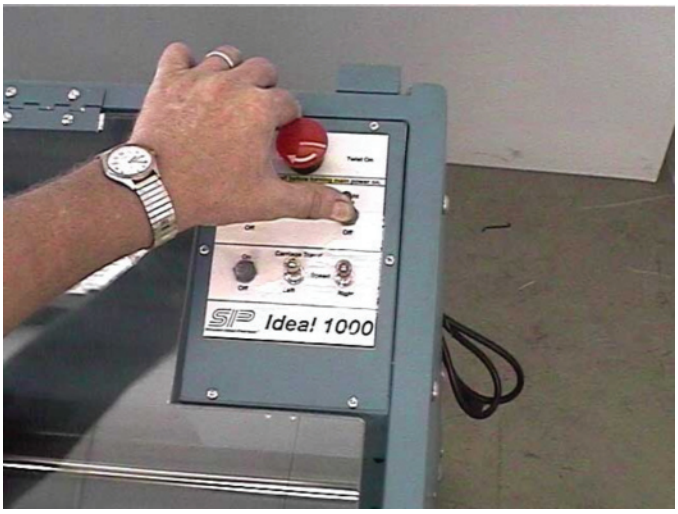
Inspect for a wavy appearance or condition along the top face of the bed knife. This would indicate that the bed knife has been adjusted to the reel with excessive pressure. This could cause worn or loose reel bearings.

3.1 Control Panel

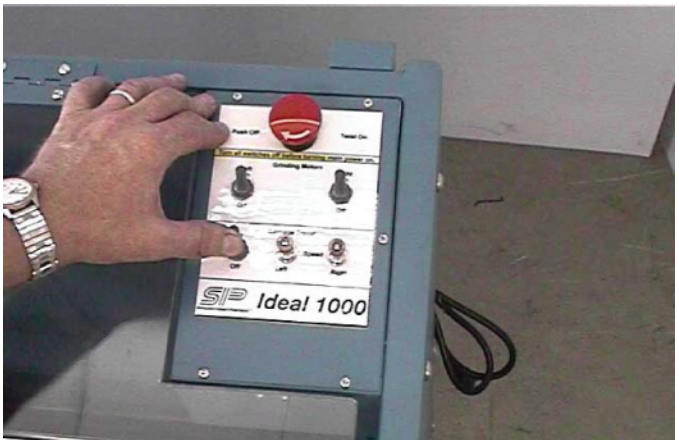


Emergency stop button controls the main power. Turn off by pushing in, turn on by turning clockwise.

Left grinding wheel motor.



Right grinding wheel motor.



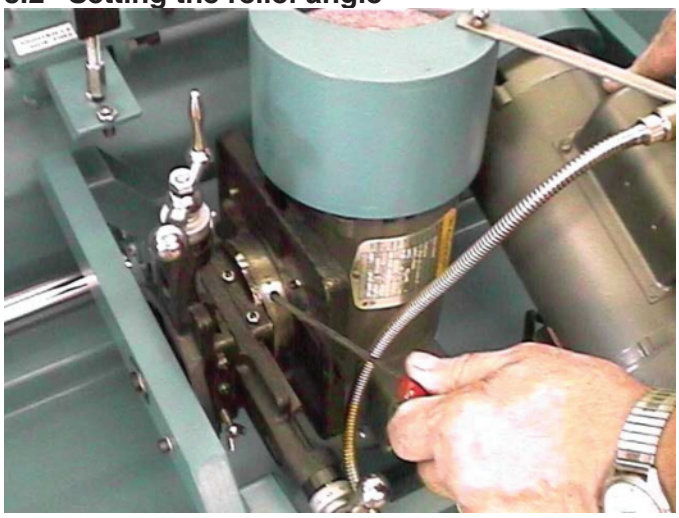
Carriage travel on-off. The carriage travel operates with air. This also turns the coolant mist on and off.

This controls the carriage speed when it travels to the left. This is a needle valve which lets air bleed from the cylinder. Opening the valve counter clockwise increases the speed. Closing the valve clockwise decreases the speed.

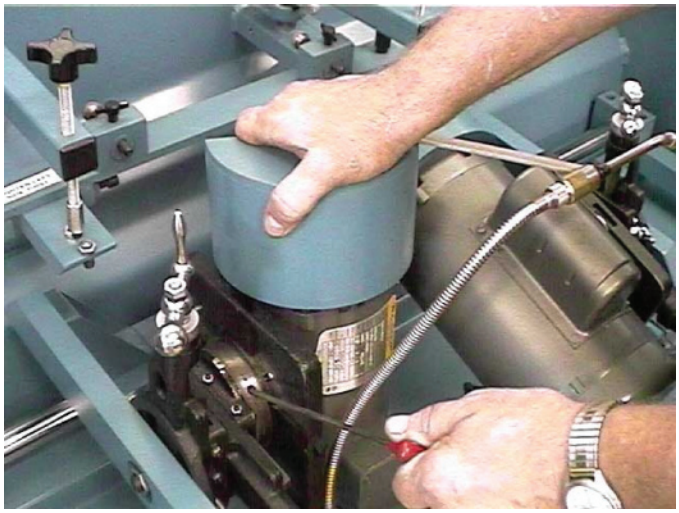
Right carriage speed. This controls the carriage speed when it travels to the right and works the same as the left carriage speed.

The coolant mist comes on when the carriage travel is turned on. If you want to operate one without the other, close the valves of either the carriage travel or coolant mist to turn it off. The gold knob controls the fluid and the black knob controls the air.

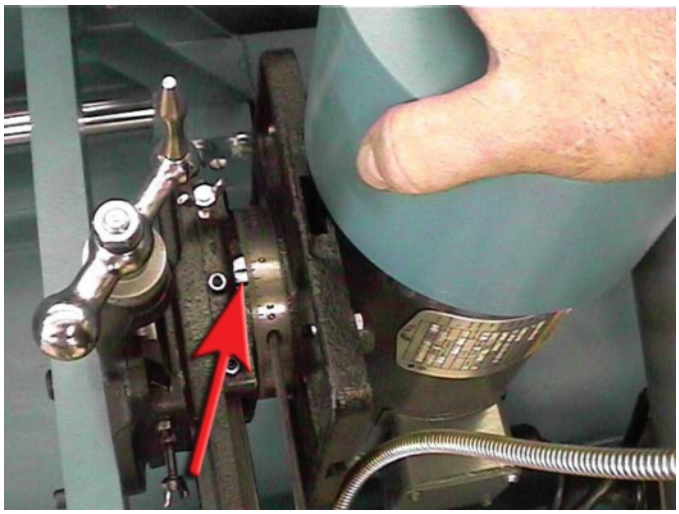
3.2 Setting the relief angle



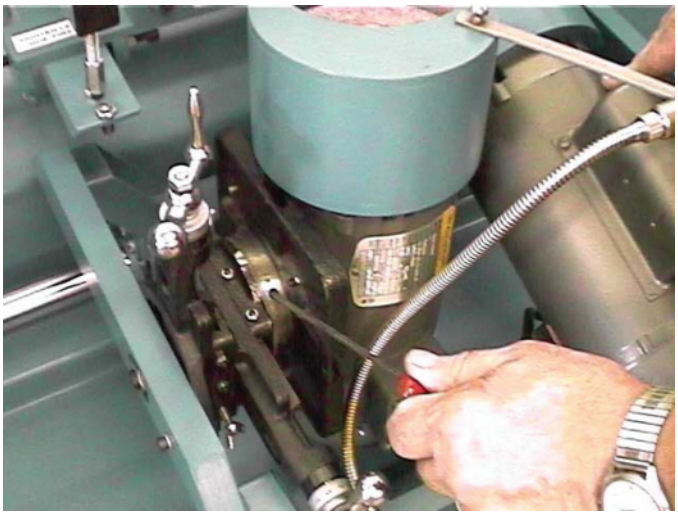
Loosen the set screws which lock the grinding head. There are two set screws on each head opposite each other. Do not back the set screw out more that one turn or it will become disengaged from the locking pad and not work properly.



Grasp the motor as shown and rotate the grinding head...



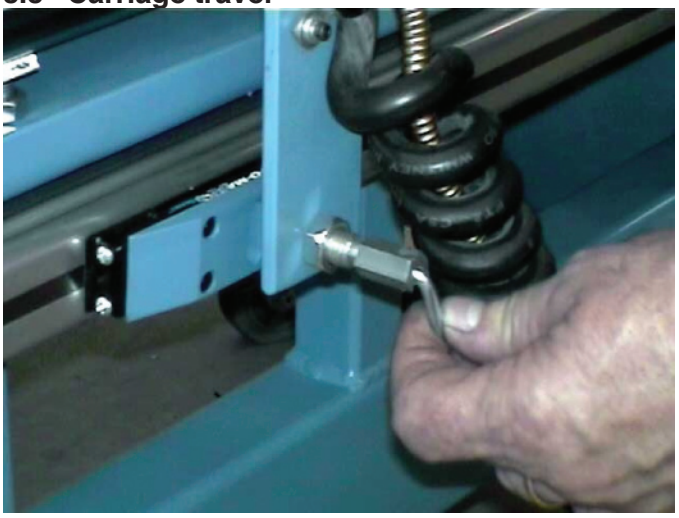
until you get the desired angle.



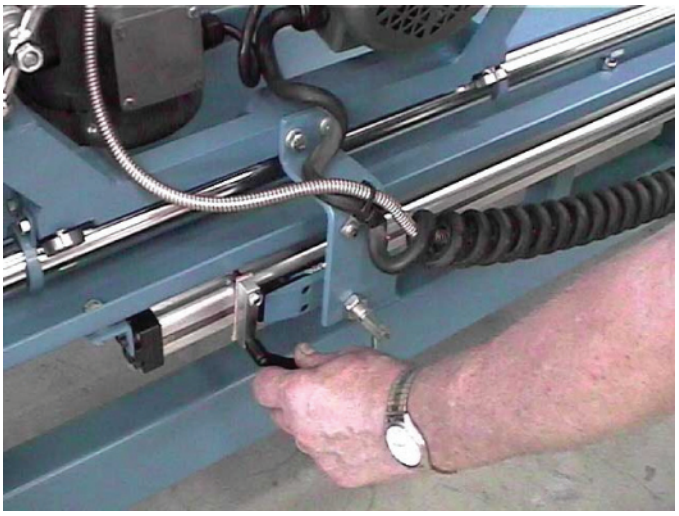
Tighten the set screws which lock the grinding head.

You need to reposition the grinding wheel so that it aligns properly with the bed knife by using the infeed and positioning feed.

3.3 Carriage travel

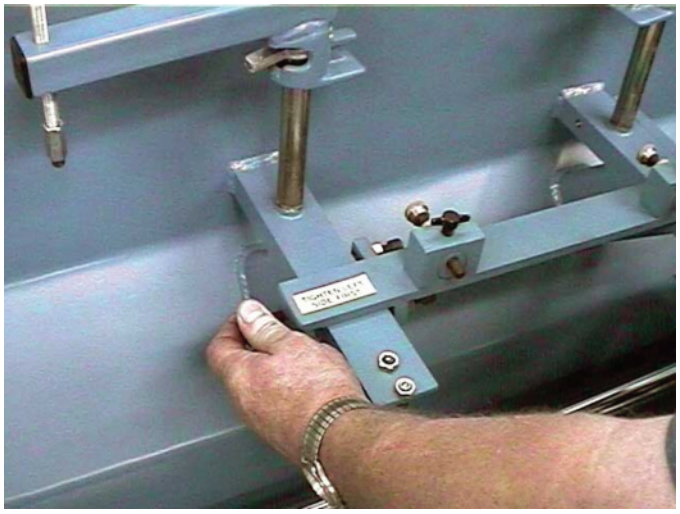


The carriage may be disengaged from the drive cylinder for easier set up by pulling and turning the latch pin. To reengage the drive cylinder, turn the latch pin until it drops in its groove, when the cylinder and head are lined up, the pin will automatically snap into the cylinder.

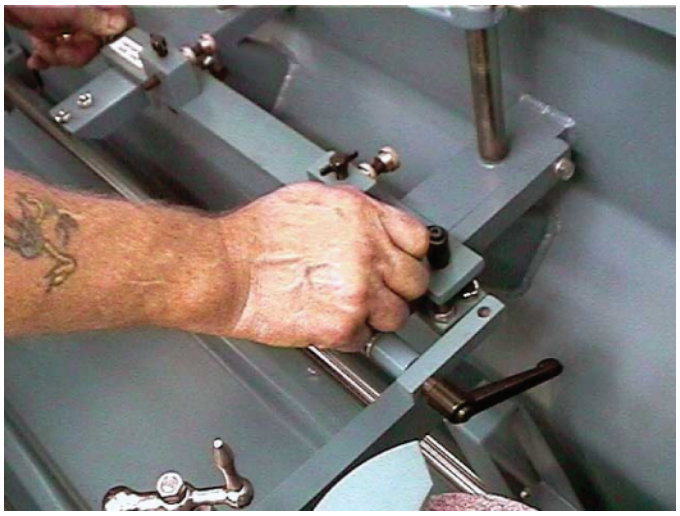


The travel stops are set by loosening the locking screw, positioning the stop and retighening the locking screw.

3.4 Position the Fence

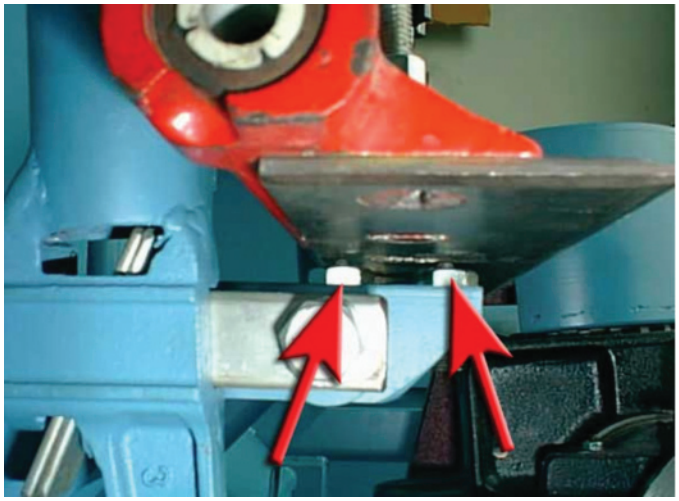


Unlock the left knob



Unclamp the right clamp.

Place the bed knife on the three support balls.



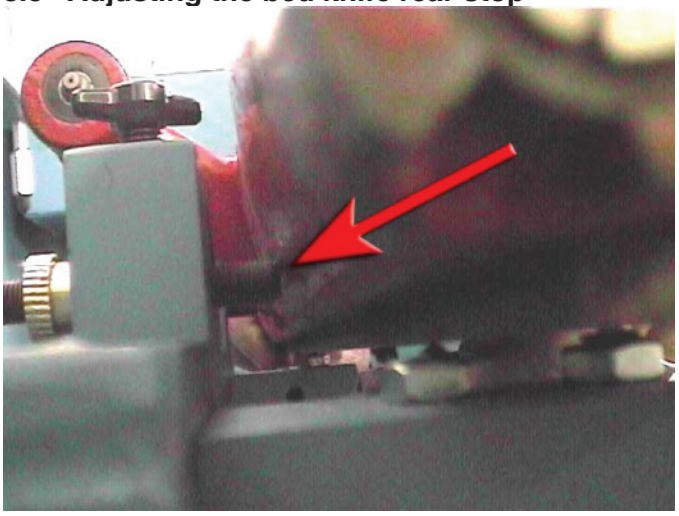
Ensure that the rear flat of the bed knife is resting on all three balls.

Slide fence against the rear of the bed knife.

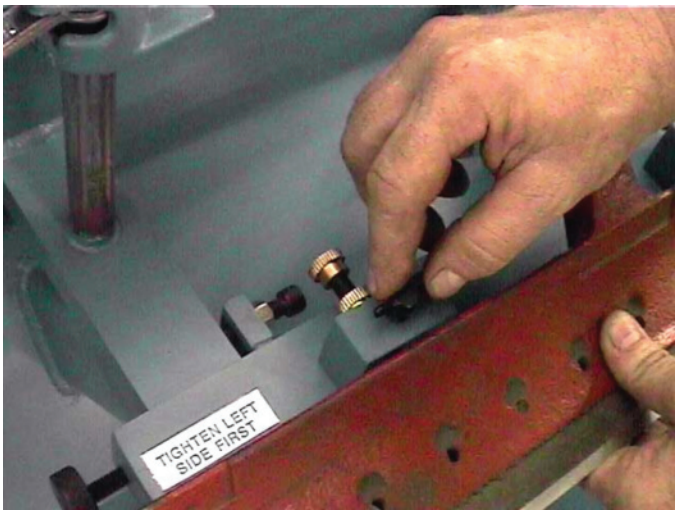
Tighten the left side first.

Then clamp the right side.

3.5 Adjusting the bed knife rear stop

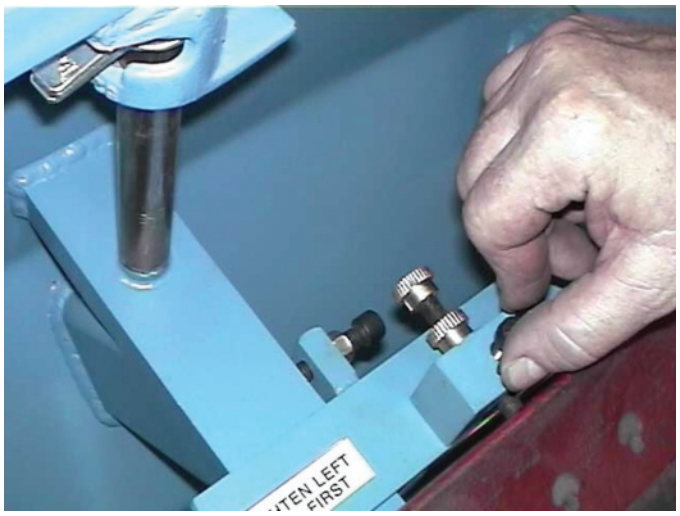


If the rear stops do not firmly contact the bed knife, they can be adjusted.



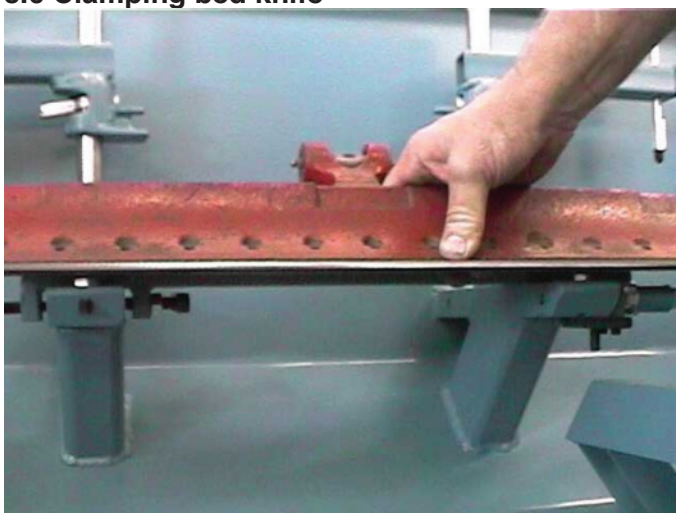
Loosen t-knob.

Rotate the cam which holds the rear stop until it firmly contacts the bed knife.

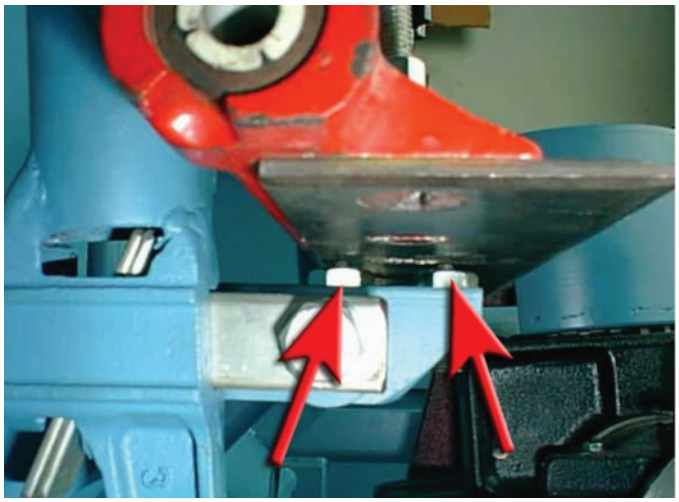


Tighten the t-knob. Repeat for other stop.

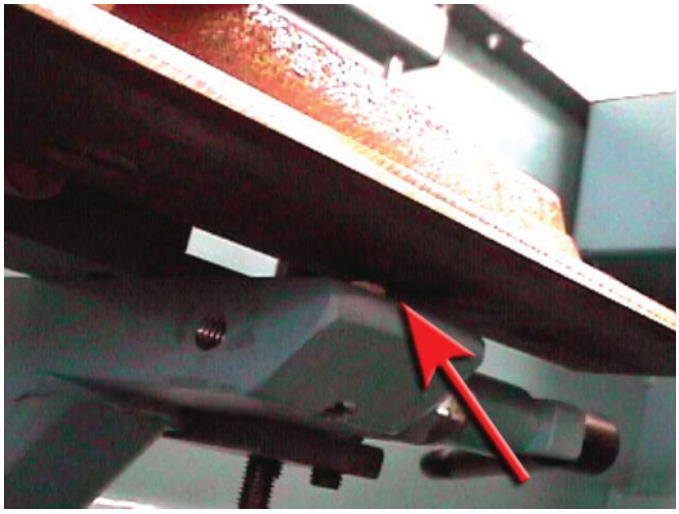
3.6 Clamping bed knife



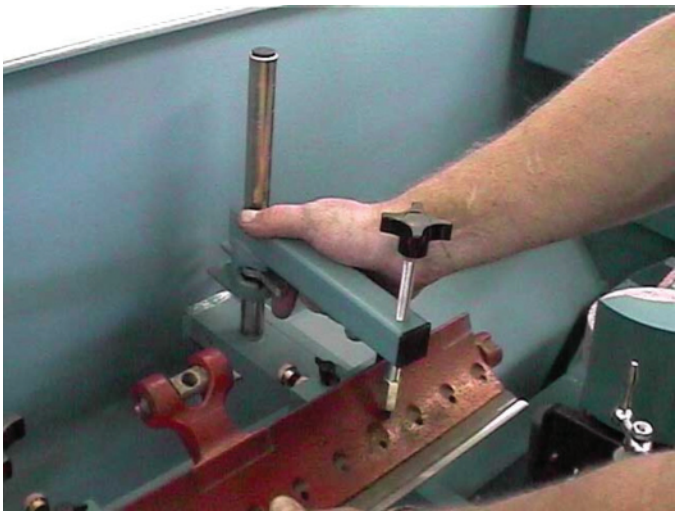
Place the bed knife on the three ball bearings and against the rear stops.



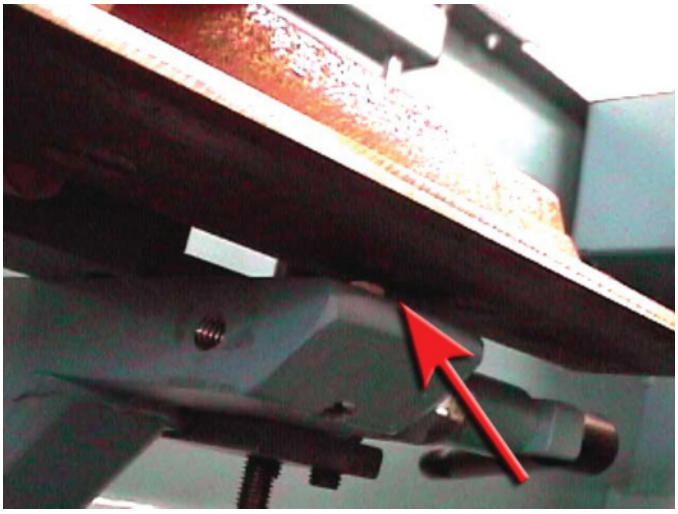
Ensure that the back flat of the bed knife is on all three ball bearings.



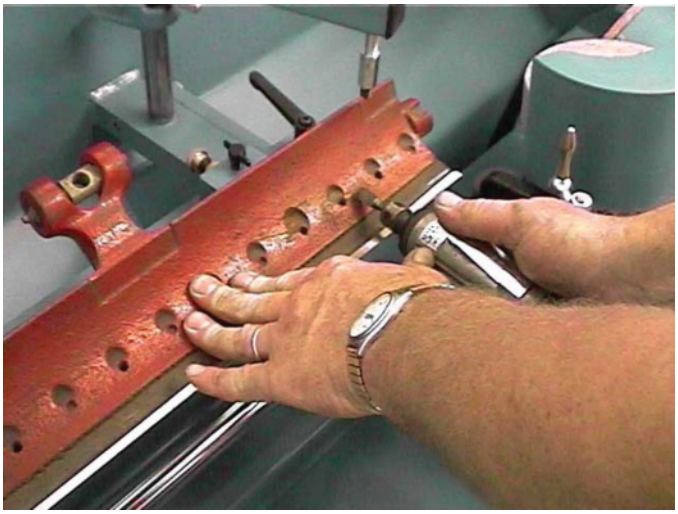
Ensure that none of the ball bearings is on a screw head.



Slide the clamps down.



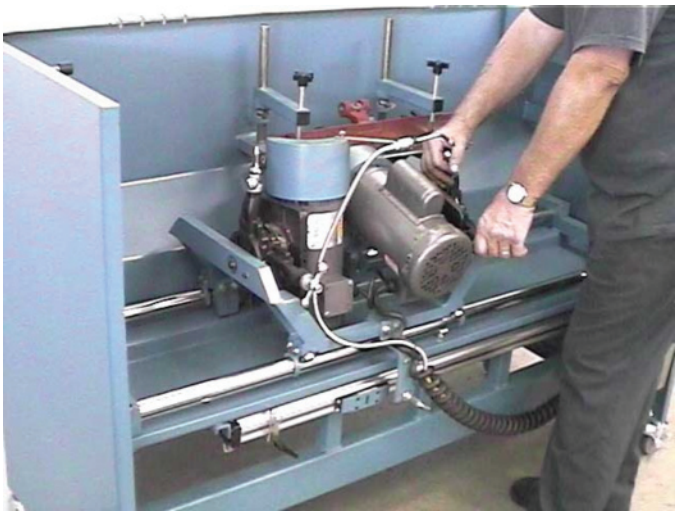
Tighten the clamps. Do not overtighten.



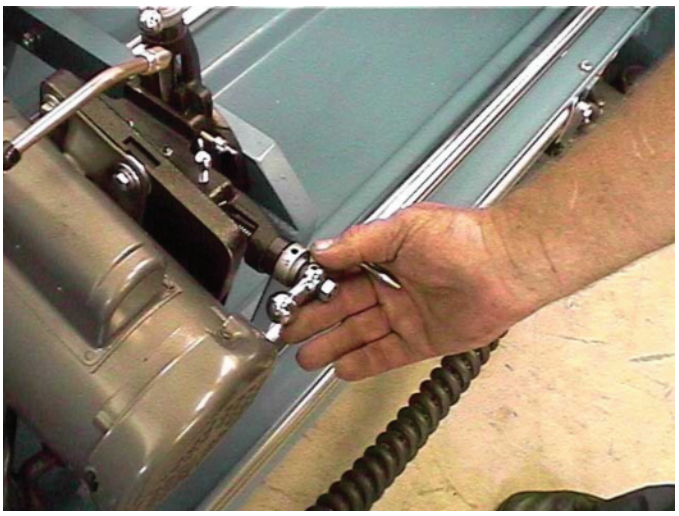
If the cone point of the clamp does not seat securely, you may want to grind a small place for it to seat.

3.7 Adjusting the front face contact

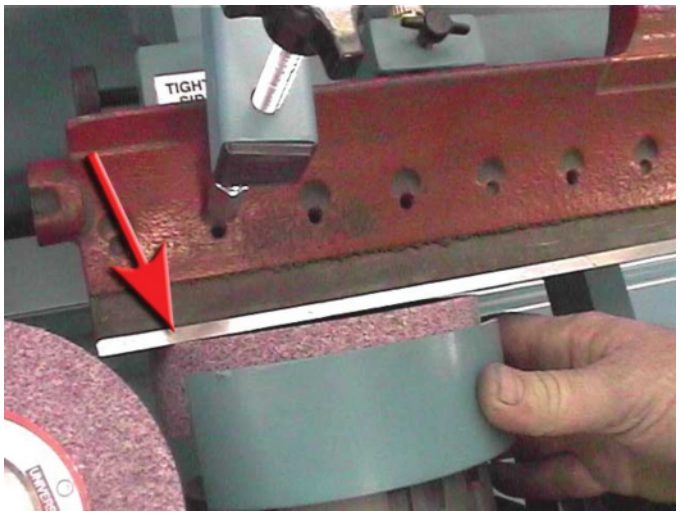
Disengage the grinding head from the air cylinder.



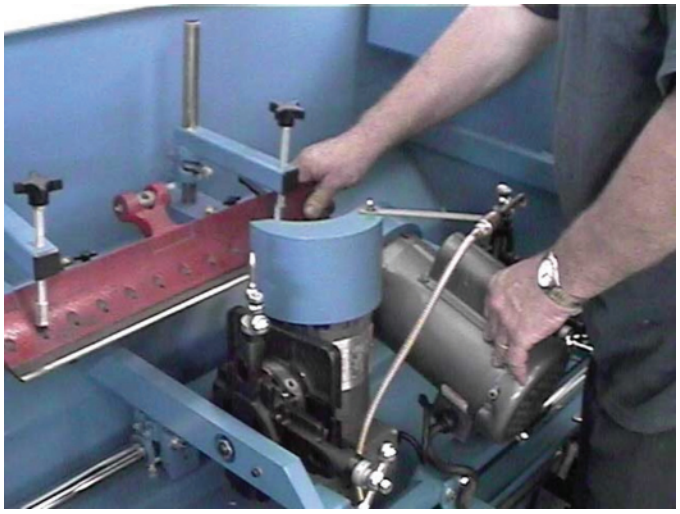
Move the grinding head across the bed knife to find the closest point between the bed knife and the front face stone.



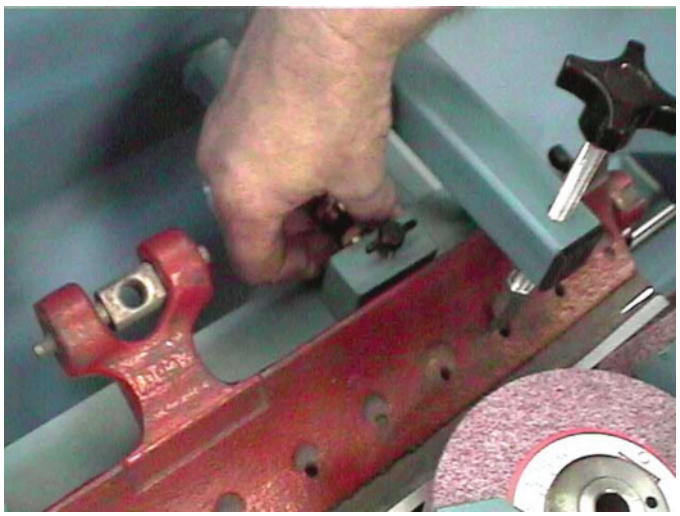
Adjust the front face stone until...



it touches the bed knife at the closest point.

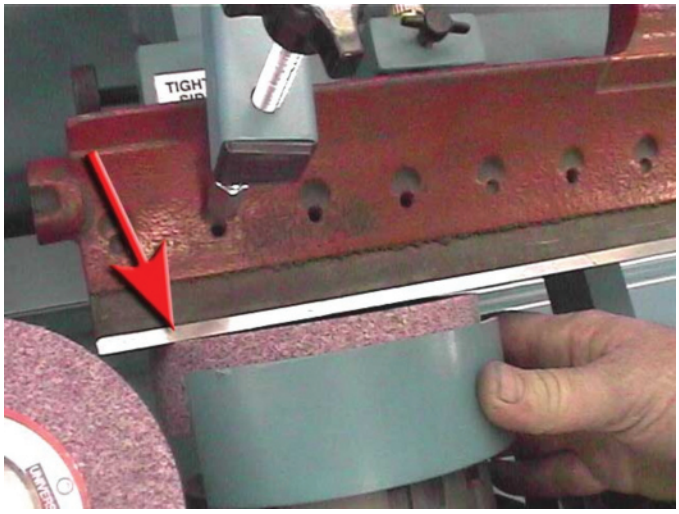


Move the grinding head to the other end of the bed knife.

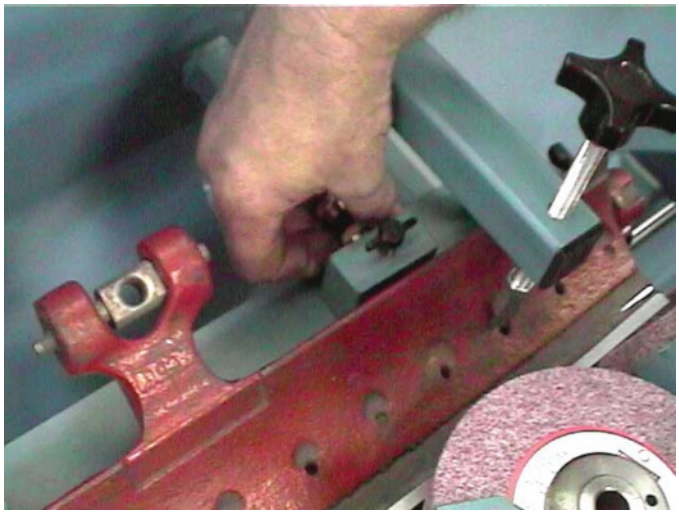


Loosen the brass knurled nut on the rear stop.

Feed the rear stop in....



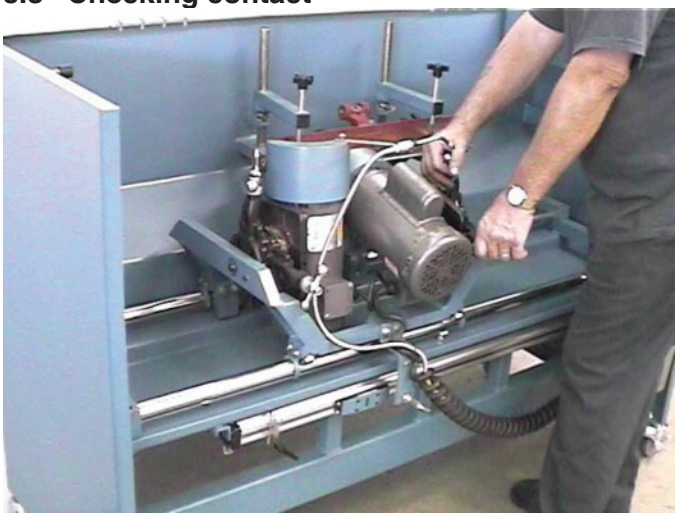
until the bed knife just contacts the front face stone



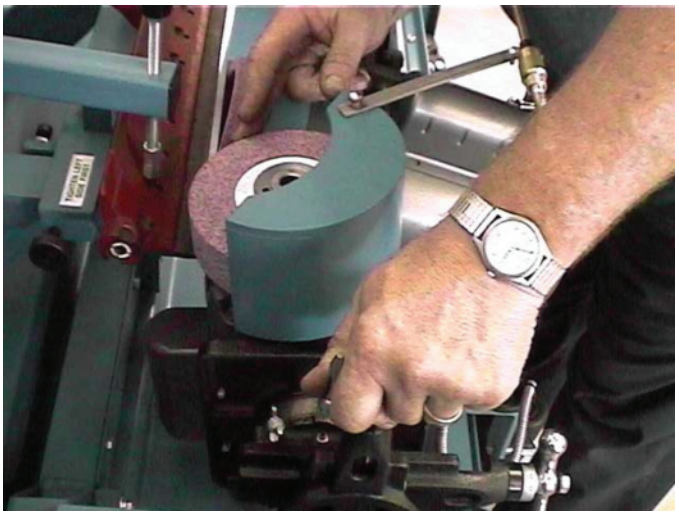
Tighten the brass knurled nut.

You may have to loosen the bed knife clamps to allow adequate movement of the bed knife.

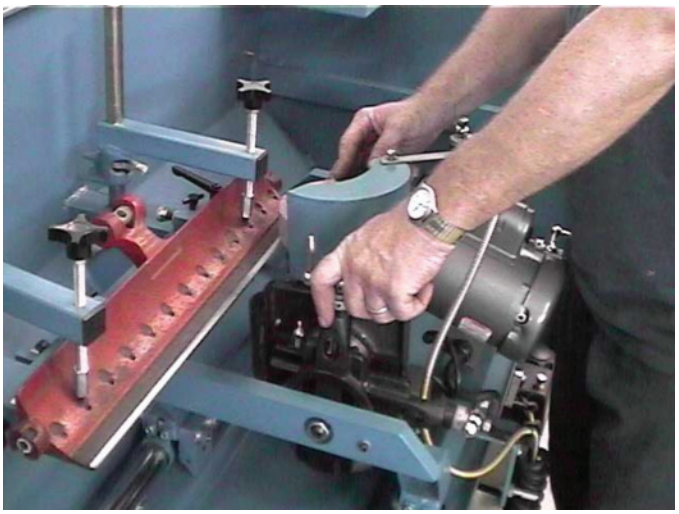
3.8 Checking contact



Move the grinding head to one end of the bed knife.



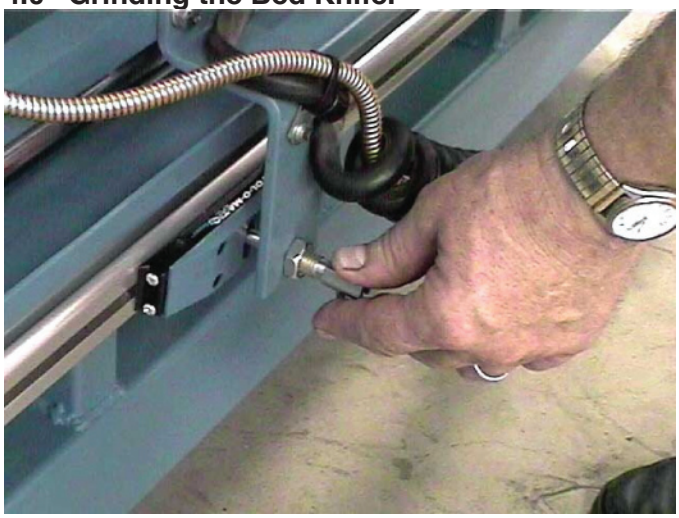
Adjust the top face stone down until it just touches the bed knife.



Move the grinding head across the bed knife. There should be even contact all the way across unless the bed knife is badly worn. If the contact is not even, recheck your set up. Repeat for the front face.

4. GRINDING

4.0 Grinding the Bed Knife.



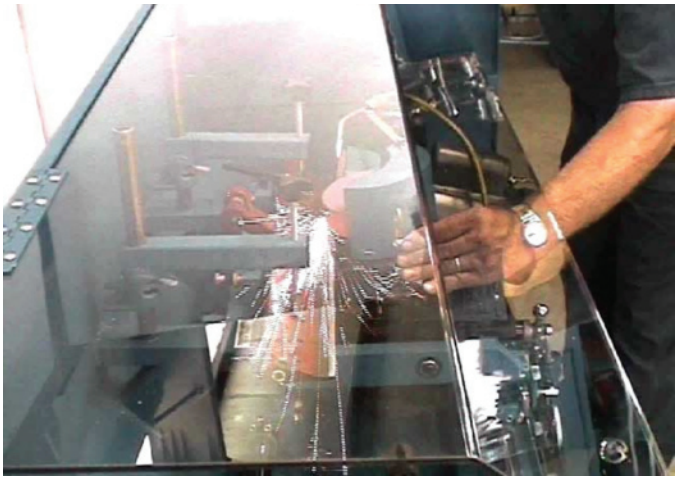
Engage the carriage into the drive cylinder.

Set the grinding head stops so that the part of the grinding wheel touching the bed knife (the inside edge) clears the ends of the bed knife.

Turn the carriage on and set the speed.

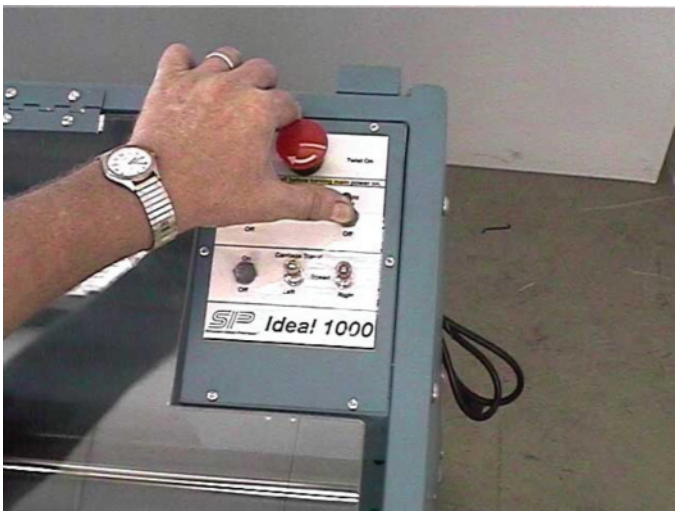
Set the coolant mist flow.

Turn the left grinding motor on.



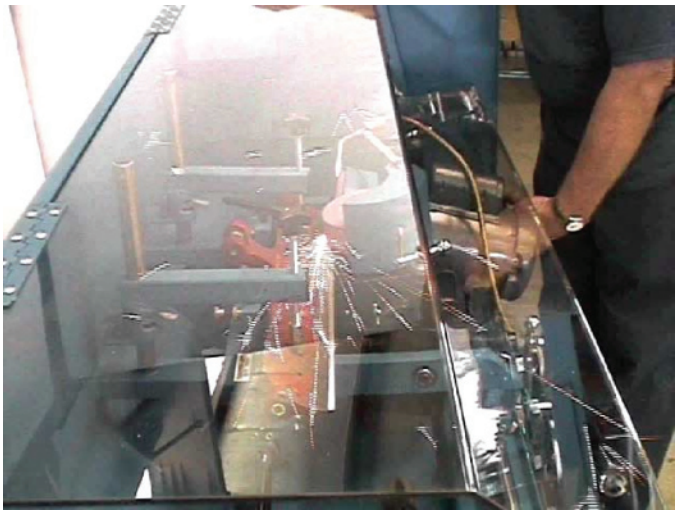
Always close shield or wear safety glasses and face shield when grinding.

infeed the grinding wheel until it starts to grind. Continue infeeding the grinding wheel until it is grinding all the way across the bed knife.



Always close shield or wear safety glasses and face shield when grinding.

Turn the right grinding motor on.

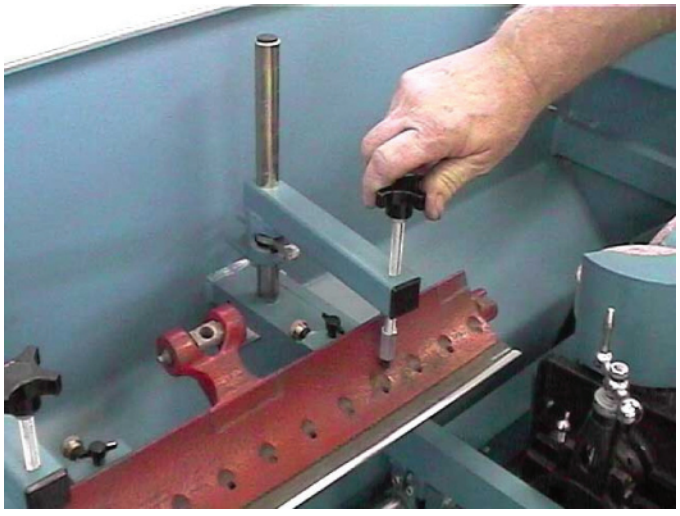


Infeed the grinding wheel until it starts to grind. Continue infeeding the grinding wheel until the front face is done.

Back off the front face right grinding wheel and turn the right grinding motor off.

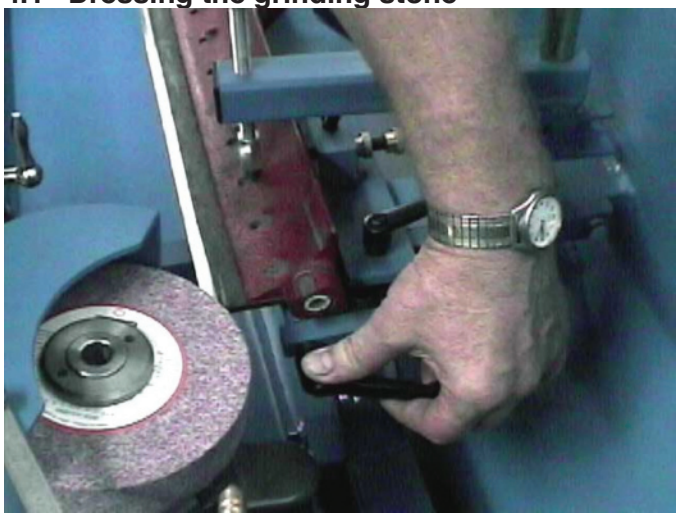
Continue infeeding left grinding head until the top face is done. Let the top face spark out after you have completed the front face.

Turn the carriage off when the grinding head is off one end of the bed knife. Turn the left grinding motor off.

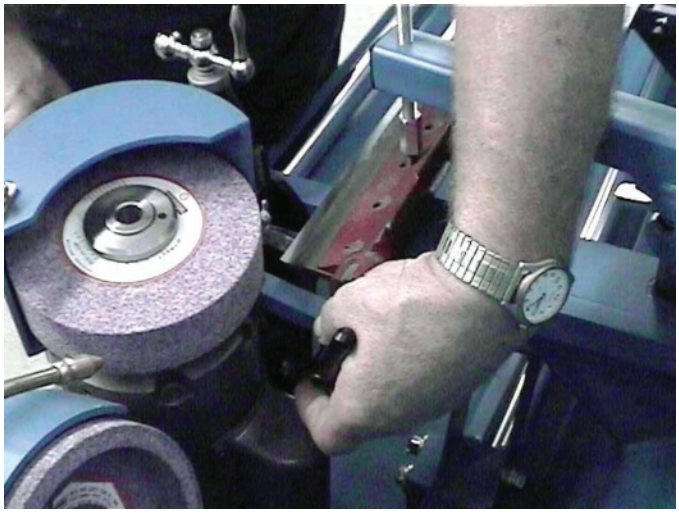


Remove the bed knife.

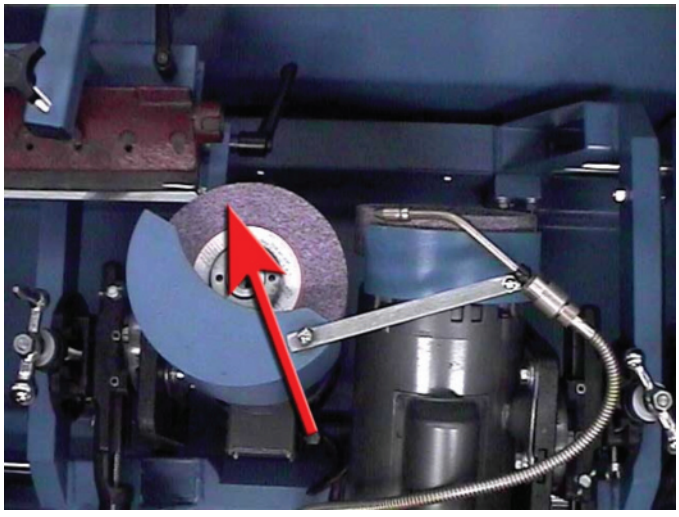
4.1 Dressing the grinding stone



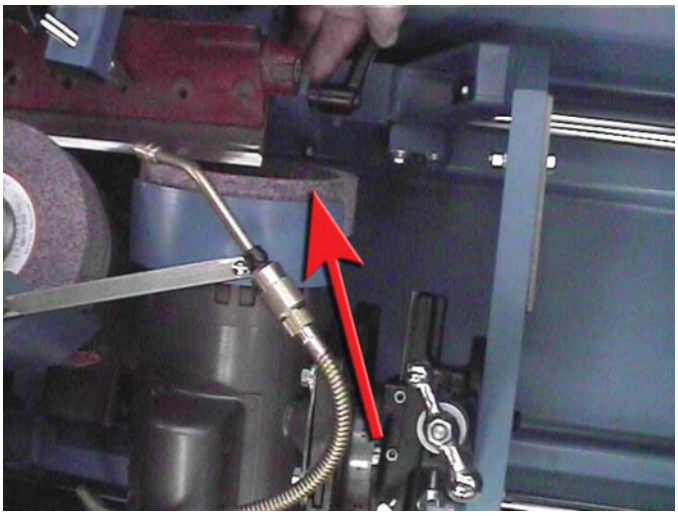
Unlock the diamond dresser mount. This handle ratchets and may be repositioned by pulling out and turning.



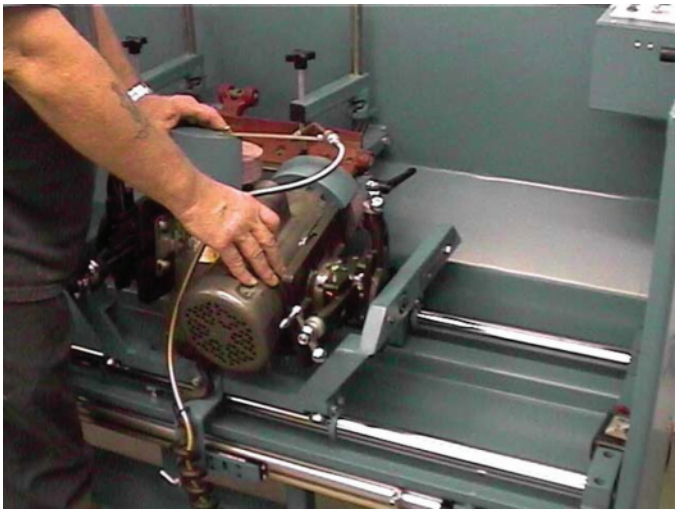
Position the diamond dresser against the stone on its outside or edge then lock the mount.



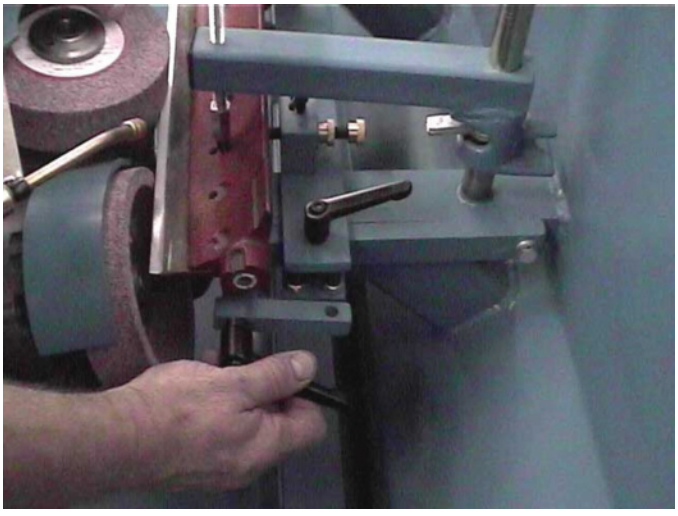
Make sure that you are dressing on the outside half of the grinding wheel, the left half of the left stone,



and the right half of the right stone.



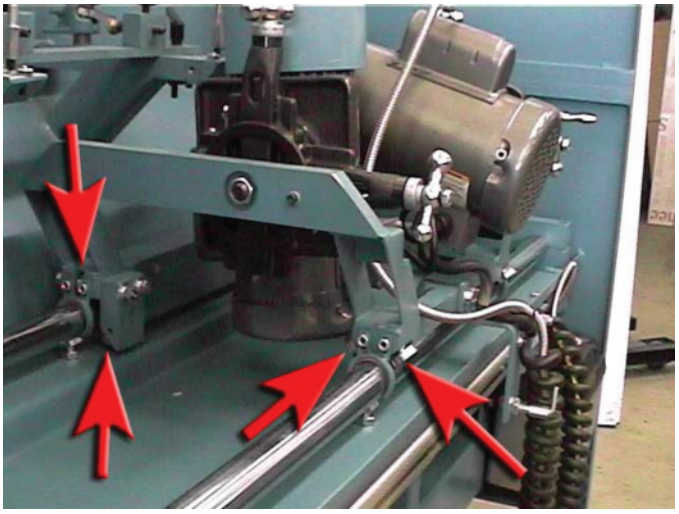
With the grinding head disengaged from the drive cylinder, turn the grinding motor on and carefully move the grinding head back and forth as you infeed the grinding head down. Continue until no sparks appear. Turn the grinding motor off.



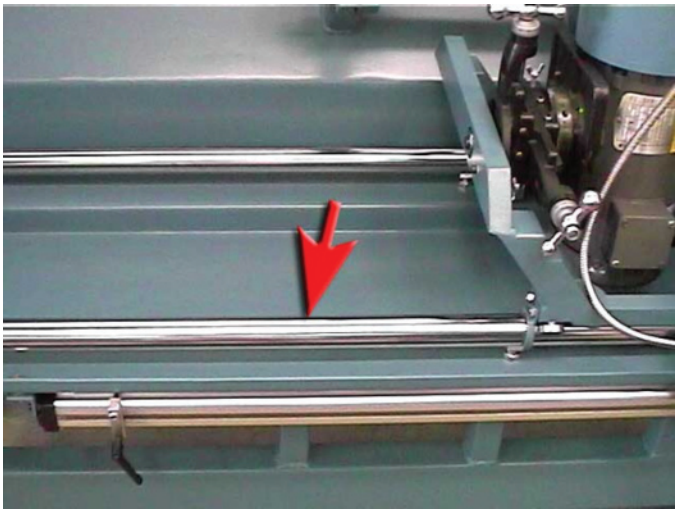
Stow the diamond dresser mount.

5. Maintenance

5.0 General maintenance

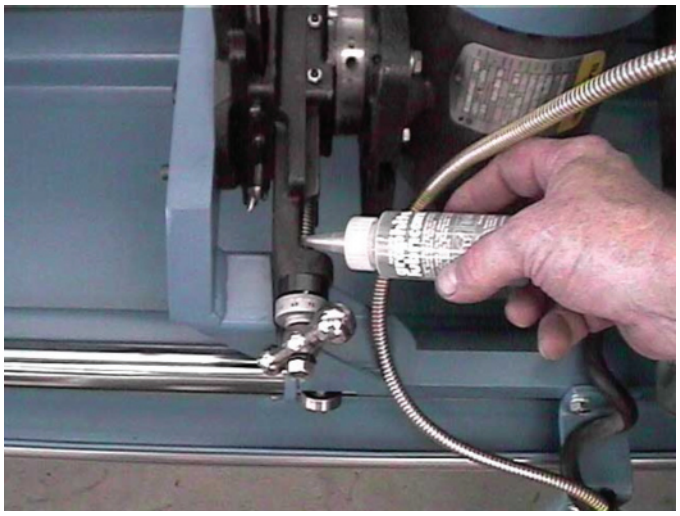


The carriage bearings are permanently sealed and lubricated. They require no lubrication or attention except to be kept clean.



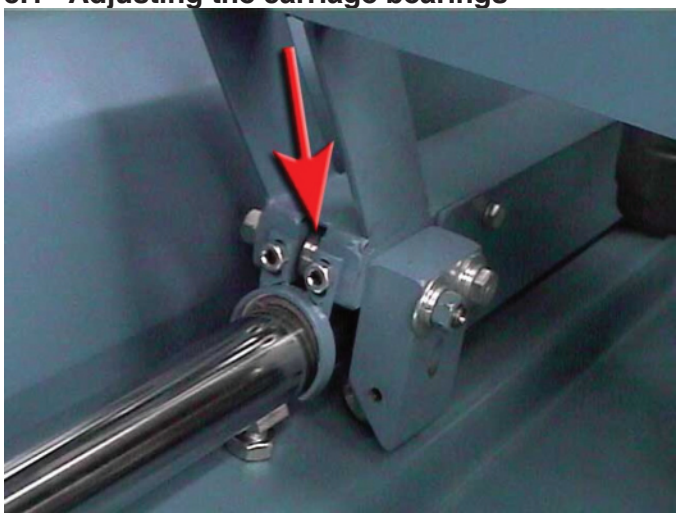
The track shafts must also be kept clean and free from grinding dust and are equipped with integral wipes. Do not oil the track shafts as that will cause the grinding dust to cling to the track shafts and make the wipes ineffective.

The grinder is equipped with totally enclosed fan cooled motors which require no regular maintenance. The motors should be cleaned periodically with either a vacuum or compressed air.

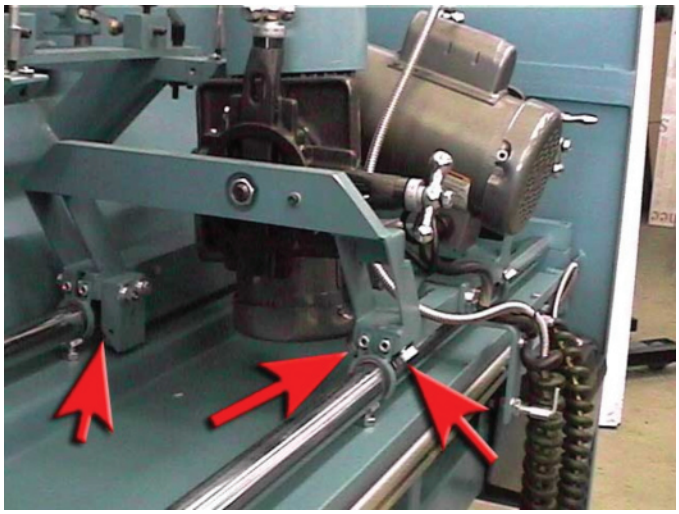


The feed screws should be lubricated lightly with dry graphite as needed for easy operation.

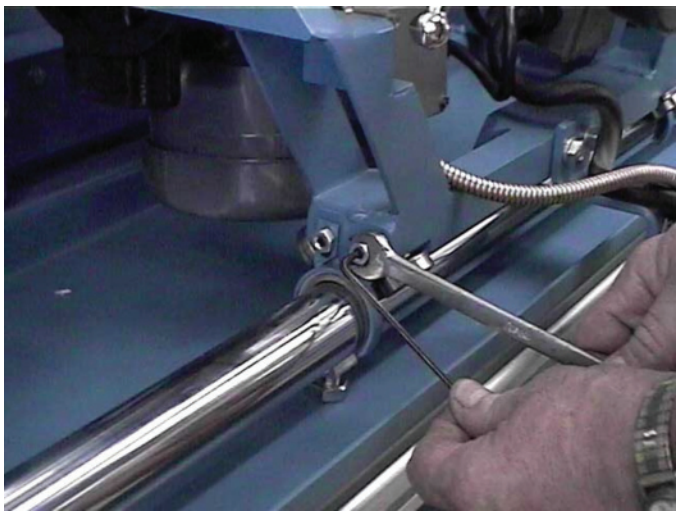
5.1 Adjusting the carriage bearings



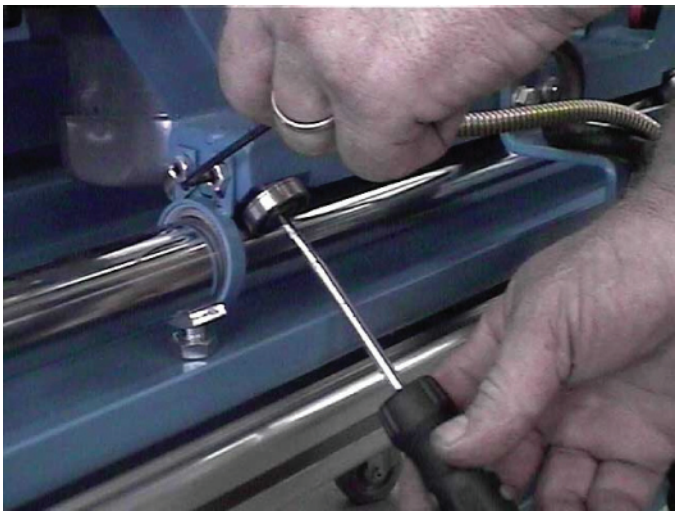
The two bearings on the top of the track shaft do not need adjusting.



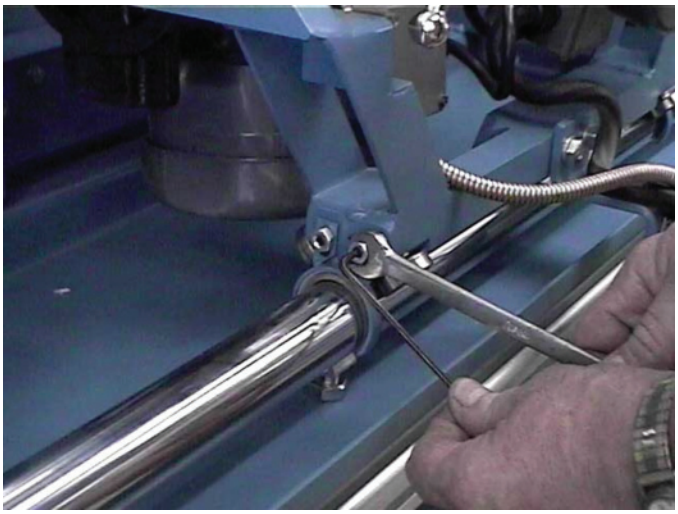
The remaining six bearings are mounted on eccentric axles and may need occasional adjusting.



Loosen the set screw which locks the bearing axle.



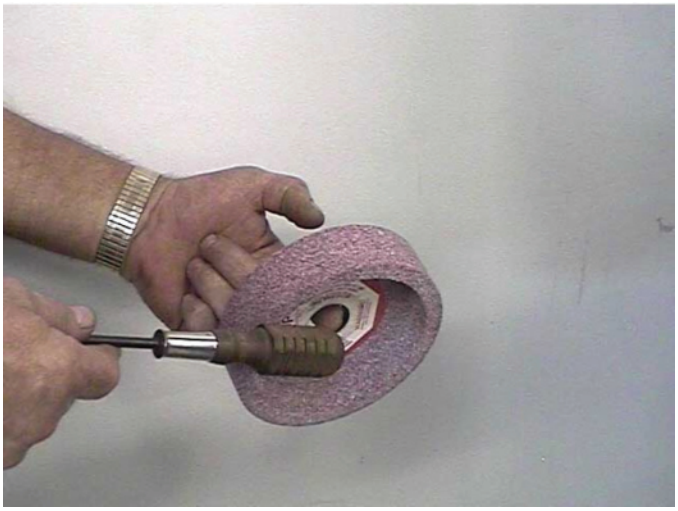
With a screwdriver, turn the axle so that bearing just touches the chromed track shaft.



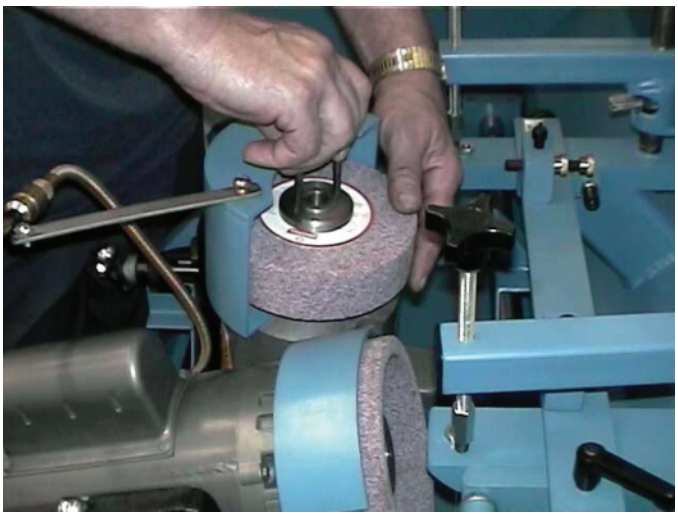
Retighten the locking set screw. The bottom bearings should just touch the track shaft and slip when turned. The top bearings should all contact the track shaft without the carriage rocking. Not all bearings will be in full contact with the track shaft over its full length.

5.2 Mounting grinding wheels

Do not use damaged grinding wheel as it may come apart and cause damage, serious injury, or loss of life.!



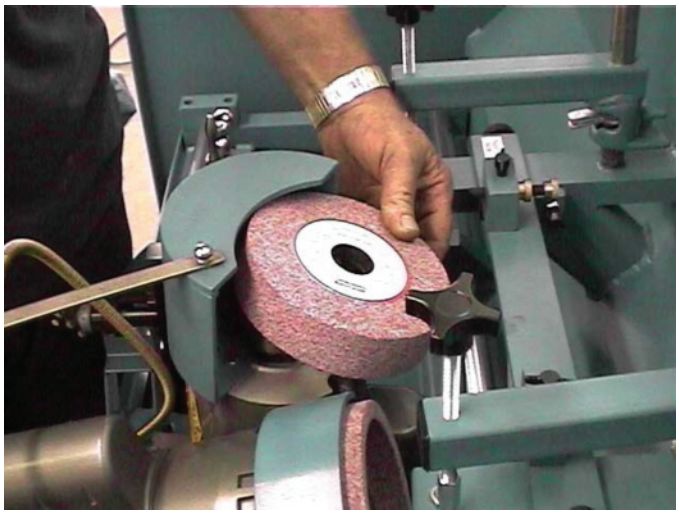
Ring a new grinding wheel to ensure it is undamaged. Do this by holding it in the arbor hole and gently tapping it with a wooden handle of a screw driver or similar tool. If the grinding wheel does not ring, do not use it.



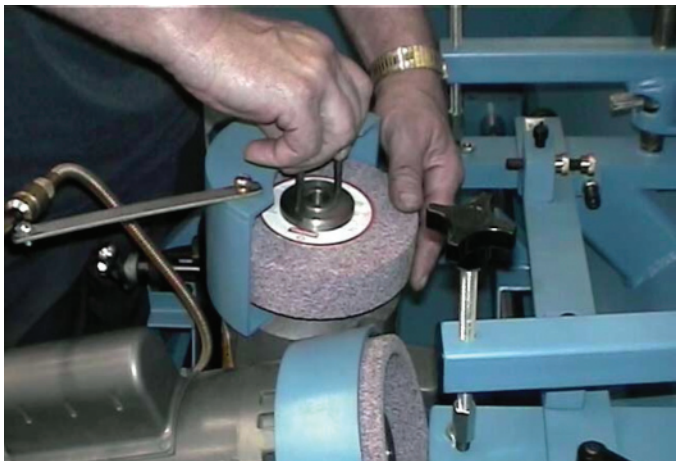
Do not overtighten the nut as it will cause the grinding wheel to explode!

Using the u-wrench provided, hold the grinding wheel and unscrew the wheel nut. The left grinder is counterclockwise to loosen. The right grinder is clockwise to loosen.

You may have to raise the left grinding head or lower the right grinding head to be able to remove the left grinding wheel.

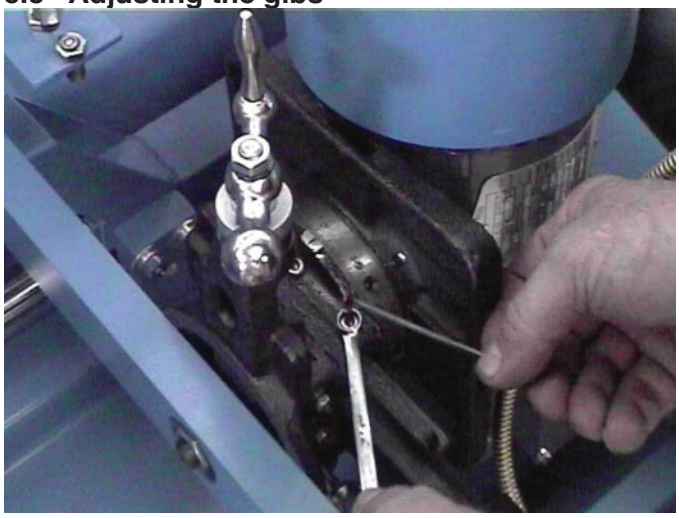


Place the new grinding wheel on the hub.



Replace the wheel nut and tighten with the u-wrench provided. Do not overtighten as you may damage the grinding wheel. Use extra caution when turning the grinding motor on and off the first few times after you have mounted the grinding wheel. If the nut is not tight enough, it and the grinding wheel may come off when you turn the motor off.

5.3 Adjusting the gibs



If the grinding head seems loose, you may need to tighten the gibs by loosening the locking nut and tightening the gib screws. Tighten screws so that there is no play in the head but the feed screw works smoothly.